FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)
PF 100 PCT US	**09/937678**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
FR00/00803	**March 30, 2000**	**March 30, 1999**

TITLE OF INVENTION

Fast-dissolving isotropic expanded microporous composition or structure for pharmaceutical, veterinary, dietetic, food or cosmetic and use and method for obtaining same

APPLICANT(S) FOR DO/EO/US

Eric Goutay, Laurence Lachamp, Jacpues Frances, Joel Bougaret and Bruno Paillard

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   - b. ☒ has been transmitted by the International Bureau.
   - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   - b. ☐ have been transmitted by the International Bureau.
   - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☐ Other items or information:

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/937678	FR00/00803	PF 100 PCT US

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	**$1,000.00**
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	**$860.00**
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	**$710.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	**$690.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	**$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$860.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	25 - 20 =	5	x $18.00	**$90.00**	
Independent claims	1 - 3 =	0	x $80.00	**$0.00**	
Multiple Dependent Claims **(check if applicable).**			☐	**$0.00**	

TOTAL OF ABOVE CALCULATIONS =	**$950.00**	
☐ Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).**	**$0.00**	
SUBTOTAL =	**$950.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +	**$0.00**	
TOTAL NATIONAL FEE =	**$950.00**	
☐ Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**	**$0.00**	
TOTAL FEES ENCLOSED =	**$950.00**	
	Amount to be: refunded	$
	charged	$

☒ A check in the amount of **$950.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **8-3220** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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25666
PATENT TRADEMARK OFFICE

G. PATRICK SAGE
SIGNATURE

G. Patrick Sage
NAME

37,710
REGISTRATION NUMBER

September 28, 2001
DATE

CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10) Applicant(s): **Eric Goutay, et al**	Docket No. 09/937678 **PF 100 PCT US**

Serial No.	Filing Date	Examiner	Group Art Unit

Invention: **Fast-dissolving isotropic expanded microporous composition or structure for pharmaceutical, veterinary, dietetic, food or cosmetic and use and method for obtaining same**

I hereby certify that the following correspondence:

National Phase Application, Preliminary Amendment , Declaration, check #70321.

(Identify type of correspondence)

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: The Assistant Commissioner for Patents, Washington, D.C. 20231

September 28, 2001
(Date)

Linda Wooden
(Typed or Printed Name of Person Mailing Correspondence)


(Signature of Person Mailing Correspondence)

EL 789475675 US
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PF 100 PCT US/lw

* * * * *

Applicants : Eric Goutay, Laurence Lachamp, Jacques Frances, Joel Bougaret and Bruno Paillard

Title : Fast-Dissolving isotropic expanded microporous composition or structure for pharmaceutical, veterinary, dietetic, food or cosmetic and use and method for obtaining same

* * * * *

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

As soon as the Serial No. and Filing Date have been accorded the above-identified application, kindly enter the following amendment:

IN THE CLAIMS: Kindly cancel claims 1-25 and replace with the following claims 26-50, which correspond to each cancelled claim.

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REMARKS:

A few constructive editorial changes have been made in the claims to bring them somewhat more into line with U.S. practice and requirements.

Applicants have cancelled all of the originally filed claims, 1-25ew claims 26-50 been added to better encompass the full scope and breadth of the invention, notwithstanding Applicants' belief that the claims would have been allowable as originally filed. Accordingly, Applicants assert that no claims have been narrowed within the meaning of Festo . The replacement Claims are attached hereto.

Entry of the amendments and favorable action on the merits are all hereby respectfully solicited.

Respectfully submitted,

THE FIRM OF HUESCHEN AND SAGE

G. PATRICK SAGE

G. PATRICK SAGE, Attorney #37,710

Dated: September 28, 2001
Customer No. 25,666
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Enclosure: Return Postal Card Receipt
Replacement Claims 26-50

CLAIMS

26. A fast dissolving composition for pharmaceutical, veterinary, food, dietetic, or cosmetic use, comprising 1% to 50% by weight of one or more active ingredients, 50% to 99% by weight of a carrier comprising one or more polymers, optionally one or more diluents and optionally one or more additives, in particular a flavoring or a coloring, the composition being characterized in that it has a fast-dissolving isotropic microporous expanded structure and the polymers being chosen from the group consisting of polymers of plant origin, optionally in combination with polymers of animal origin or synthetic polymers, and the carrier being such that the binding polymer(s) are present in the composition in a proportion greater than or equal to 1% (w/w) and more particularly of between 6% and 98% (w/w) and in that it is capable of being obtained by the method comprising the steps of:
   - homogenizing a pasty formulation comprising the active ingredient(s), the polymer(s), optionally the additives(s) and the diluents,
   - injecting into a molding component,
   - simultaneous drying a molding by a microwave or high-frequency type method with a vacuum level of between 30 and 700 x 10^2 Pa.

27. The composition of claim 26, wherein the polymer of plant origin is selected from polysaccharides obtained by chemical or enzymatic hydrolysis of chemically modified starch, polymers of a chemically modified cellulosic type, and polymers of a gum type, or mixtures thereof.

28. The composition of claim 27, wherein the polysaccharide is selected form maltodextrins or glucose syrups, and sodium glycolates of starch and mixtures thereof.

29. The composition of claim 28, wherein the polymer of plant origin is selected form maltodextrins and glucose syrups having a dextrose equivalent (DE) level of between 3 and 50 and preferably between 6 and 34, and mixtures thereof.

30. The composition of claim 27, wherein the polymer of plant origin of the cellulosic type is selected from carboxymethyl cellulose sodium of low or medium viscosity, hydroxypropyl methyl cellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and mixtures thereof.

31. The composition of claim 27, wherein the polymer of plant origin is of the guar gum, gum arabic, xanthane, pectin and alginate type, or mixtures thereof.

32. The composition of claim 26, wherein the synthetic polymer is polyvinylpyrrolidone.

33. The composition of claim 26, wherein the polymer of animal origin is selected from sodium caseinates, chitosan, their water-soluble hydrolysis derivatives, gelatin, collagen, chondroitic acid sulfate, hydrolysates thereof, and mixtures thereof.

34. The composition of claim 26, wherein the polymer(s) is/are present in the formulation at a percentage at least equal to 1%(w/w) and more particularly between 6% and 98% (w/w), and compatible with a viscosity of between 100 mPa.s and 100,000 mPa.s.

35. The composition of claim 34, wherein the polymer(s) are present in the formulation at a percentage at least equal to 1% (w/w) and more particularly between 6 and 98% (w/w), and compatible with a viscosity of between 100 mPa.s and 50,000 mPa.s.

36. The composition of claim 26, wherein the optional diluent is selected from mannitol, sucrose, lactose, fructose, sorbitol, xylitol, maltitol and dicalcium phosphate dihydrate.

37. The composition of claim 26, wherein the density is less than 0.9 g/cm^3 .

38. The composition of claim 37, wherein the density is between 0.2 and 0.7 g/cm^3 .

39. The composition of claim 26, wherein the composition has a disintegration time of less than 1 minute, preferably 30 seconds, under conditions of use on direct contact with a mucous membrane, in particular the buccal mucous membrane, or in an appropriate volume of water.

40. The composition of claim 26, wherein the active ingredient(s) in the isotropic expanded microporous matrix are in the dissolved or dispersed state or in film-coated forms.

41. The composition of claim 40, wherein the active ingredient(s) are selected, without limitation, from analgesics, antimigraines, antipyretic analgesics and/or anti-inflammatory agents, local anesthetics, antianginals, anticholinergic antispasmodics, antisecretory agents, muscle relaxants, antinauseants, and central and peripheral vasodilators.

42. The composition of claim 41, wherein the active ingredient is selected from the group consisting of milnacipran, piroxicam, phloroglucinol, and domperidone.

43. The composition of claim 26, wherein the final packaging serving as the molding component is of the polypropylene type.

44. The composition of claim 26, wherein the final packaging is of the polytetrafluoroethylene type (e.g.: Teflon®).

45. A process for preparing a fast-dissolving composition for pharmaceutical, veterinary, food, dietetic, or cosmetic use as claimed in claim 26, wherein a pasty formulation comprising one or more active ingredients, one or more polymers, optionally one or more additives, and one or more diluents is homogenized; the formulation is injected into a molding component, and then drying and molding are carried out simultaneously by a microwave or high frequency type process with a vacuum level of between 30 and 700 x 10^2 Pa, and preferably between 60 and 500 x 10^2 Pa (30 and 700 mbar and preferably between 60 and 500 mbar) to give rise to an isotropic microporous expanded structure of regular form, in particular having a density of less than 0.9 g/cm^3.

46. The process of claim 45, wherein the pasty formulation obtained by homogenization has a viscosity of between 100 mPa.s and 100,000 mPa.s, preferably between 100 mPa.s and 50,000 mPa.s, followed by injection or extrusion of the formulation into the final packaging.

47. The process of claim 45, wherein the temperatures during the drying and forming phase are between 25°C and 80°C, thereby avoiding the degradation of the heat-labile active ingredients.

48. The process of claim 45, wherein the drying and forming operations are simultaneous and are less than 1 hour in duration, preferably 30 minutes.

49. The process of claim 45, wherein the component in which the simultaneous drying-molding is carried out is the final packaging.

50. The process of claim 45, wherein the process of production is carried out continuously.

FAST-DISSOLVING ISOTROPIC EXPANDED MICROPOROUS COMPOSITION OR STRUCTURE FOR PHARMACEUTICAL, VETERINARY, DIETETIC, FOOD OR COSMETIC USE AND METHOD FOR OBTAINING SAME

The invention relates to novel fast-disintegrating, or even instant-disintegrating, homogeneous microporous compositions for pharmaceutical, veterinary, food, dietetic or cosmetic use, intended for the oral route or to be applied in contact with the mucous membranes and a method for producing them.

Fast-disintegrating or instant-disintegrating solid compositions for the oral route have for a very long time been of interest to formulators and also to practitioners and patients who find in them interesting characteristics in terms of compliance. As regards very young or old subjects in whom deglutition of solid forms poses problems, the compositions as provided in the present invention offer a real advantage because they can be taken either in a glass of water or directly under the tongue or they disintegrate instantly.

By virtue of these characteristics, the compositions which are the subject of the invention represent the ideal solution for an ambulatory treatment.

Furthermore, they respond favorably to the unconscious association made by the patient between speed of dissolution or of disintegration of the composition and speed of action of the molecule, especially for analgesics, antinauseants, antiulceratives, anti-asthmatics and antianginals. This unconscious association being sometimes able to enhance the efficacy of the molecule.

The expression fast-disintegrating form is understood

to mean galenic forms whose disintegration remains less than 15 minutes in accordance with the tablets monograph (Compressi) of the French or European pharmacopoeia.

Several fast-disintegrating formulations are already used in the pharmaceutical field. Effervescent tablets or granules allow disintegration in less than 5 minutes through the fast dissolution or dispersion of the molecule by virtue of the controlled release of carbon dioxide gas obtained from an acid-base chemical reaction.

This technology, which is currently very widely used and is described in many patents (EP 673 644; EP 369 228; FR 2 552 308), remains mastered at the industrial level by few companies. Indeed, this technique requires a substantial know-how in the carrying out of the wet granulation step, but also a controlled humidity environment which is very expensive to maintain.

Furthermore, the substantial size and effervescence of the form do not make it possible to use conventional effervescent tablets in the buccal cavity or in the absence of water.

This problem has been solved in novel formulations called microeffervescent formulations which were the subject of the recent American patent US 5 178 878.

Water-dispersible tablets or granules constitute fast-disintegrating forms whose property is essentially based on the use of compounds called super-disintegrants. Upon contact with water, they produce, through their very high swelling power, "the explosion" of the compressed or granular mass.

Many patents describe this type of galenic forms

(FR 95/00947, EP 0 347 767, EP 0 716 852 and EP 0 361 354) and the great majority uses the following compounds: starch glycolate, microcrystalline cellulose, carboxymethyl cellulose and polyvinylpyrrolidone which are crosslinked.

Some authors use less common disintegrants such as clays of the smectite or actapulgite type (WO 92/13527), or gums and more particularly guar gum (EP 0 273 005).

As for the effervescent tablets, these forms are very difficult to use in water and therefore poorly suited to ambulatory buccal or sublingual use. It is also necessary in very many cases, to increase the volume and thus the weight of the tablet in order to have a specific surface area compatible with fast disintegration.

The formulation of this type of tablet which may appear to be simple at first glance, is in fact quite complex and is based on a compromise between hardness and disintegration which has to be optimized as much as possible, according to the physico-chemical nature and the amount of active ingredient.

Recently, patent EP 764 019 describes the development, using sugars amorphized by extrusion, of fast-disintegrating forms by a method minimizing the compression phase (compaction with compressing-metering device). Given the low hardness of the compacts, the company holding this novel form had to solve the packaging (blister type) step by adapting methods which are not very compatible with industrial throughputs.

Furthermore, the effervescent and water-dispersible tablet technologies are based on batch processes including a phase of compressing one or more pulverulent mixtures.

This necessarily results in a low production throughput compared with a continuous process and, consequently, an increase in the production cost.

In parallel with the preceding two tablet forms, solid unit forms exist in the pharmaceutical field which are manufactured by lyophilization, called oral lyophilizates.

This lyophilization technology has been known for years (FR 2 403 078) and is used to preserve and administer molecules which are sensitive from the physico-chemical point of view.

This clumsy and expensive technology, in which the duration of lyophilization at the industrial level is close to 24 hours, whose energy consumption is high (5 kW/h par kg of water), does not allow, in contrast to the present invention, application, for economic reasons, to all products.

However, through the use of judiciously chosen excipients, the lyophilization makes it possible to obtain forms exhibiting fast-disintegration either in contact with a suitable volume of water or after bringing into contact with saliva.

Many recent documents describe this type of galenic forms (GB 2 111 423, US 5 039 540, US 5 120 549, WO 94 14422 and EP 651 997, EP 399 902).

Advantageously, these lyophilizates are suitable for ambulatory buccal and sublingual use. On the other hand, during the bringing into contact with the buccal mucous membrane, the solid powders used in the formulation confer an unpleasant, distinctly perceptible granular sensation. Furthermore, regardless of the fast-disintegrating forms used, their delicate

and not very flexible mode of preparation does not make it possible to adapt the rate of disintegration according to the use requirement.

The object of the present invention is to provide novel compositions and their method of production as described below and illustrated in the examples, which make it possible to obtain disintegration times which are equal to or even less than oral lyophilizates. Like the latter, the novel form may be dissolved, either with a suitable volume of water, or directly in the mouth or in contact with the mucous membranes.

On the other hand, the compositions according to the invention, by virtue of their formulation and their continuous method of production comprising a phase of mixing the components, of extruding or injecting the pasty composition into a blister, and then a continuous microwave drying-forming phase under vacuum, have a completely different texture where the solid particles solubilized at one moment of the process are no longer perceptible during the bringing into contact with the buccal mucous membrane. Furthermore, the continuous method of production at the pilot or industrial level allows, through its adaptability (time as a function of the volume) and its lower energy consumption, it to be a lot less expensive than the lyophilization method.

The composition according to the invention for pharmaceutical, veterinary, food, dietetic or cosmetic use and affording fast dissolution in an aqueous medium or on contact with the mucous membranes comprises 1% to 50% by weight of one or more active ingredients, 50% to 99% by weight of a carrier comprising one or more polymers, optionally one or more diluents and optionally one or more additives, in particular a flavoring or a coloring, said composition being characterized in that it has a fast-dissolving isotropic microporous expanded structure and the polymers being

chosen from the group consisting of polymers of plant origin, optionally in combination with polymers of animal origin or synthetic polymers, and said carrier being such that the binding polymer(s) is/are present in the composition in a proportion greater than or equal to 1% (w/w) and more particularly of between 6% and 98% (w/w).

The composition has a porous structure, especially a density of less than 0.9 g/cm^3.

A disintegration test which is appropriate because it illustrates the behavior during disintegration of the compositions consists in placing the composition in a beaker containing 100 ml of water whose temperature is between 15 and 25°C. The time necessary for the entire form to be dissolved is noted.

On the other hand, the USPXXIII apparatus No. 2 method termed paddle apparatus using, as dissolution medium, distilled water at 37°C and a paddle rotating speed of 50 RPM was used as in vitro dissolution test.

In the case of the so-called expanded form, the expansion level refers to the ratio of the volume of the compositions after drying-forming to the ratio of the volume before drying.

This change in volume also being accompanied by a variation in the density.

This novel pharmaceutical, veterinary, dietetic, food or cosmetic form in which the homogeneous and controlled expansion of the polymer by virtue of the operating conditions of the microwave drying-forming phase under vacuum makes it possible to obtain an isotropic porous structure then conferring a rate of disintegration in water or the buccal cavity or on contact with the mucous membranes which may range from

a few seconds to several minutes depending on the use requirement.

The novelty of this invention is also based on the choice of the polymer(s), of the diluent(s) used for the constitution of the matrix network of the form, but also on the method of production which makes it possible to continuously produce, in a time of less than 1 hour, preferably of less than 30 minutes, forms whose porosity and form can be modulated during the continuous microwave drying-forming phase under vacuum.

Among the active ingredients which are suitable for producing the composition according to the invention, there may be mentioned as a guide and without limitation the active ingredients chosen from the group consisting of medicaments and food additives.

The active ingredients used have a very different solubility such as Milnacipran (aqueous solubility equal to 800 g/l), piroxicam and domperidone (aqueous solubility of less than 100 mg/l) and phloroglucinol (aqueous solubility in the region of 30 g/l).

There may also be mentioned, without limitation, as antimigraine analgesics, derivatives of ergot of rye (ergotamine, dihydroergotamine, methysergide) or serotonin antagonists (cyproheptadine, pizotifen, oxeterone). As antipyretic analgesics and/or anti-inflammatory agents derived from arylcarboxylics, there may be mentioned salicylic acid, acetylsalicylic acid, mefenamique acid. As antipyretic analgesics and/or anti-inflammatory agents derived from arylalkanoic acids, there may be mentioned diclofenac, indometacin and as antipyretic analgesics and/or anti-inflammatory derivatives of enolic acids, there may be mentioned phenylbutazone and tenoxicam. As local anesthetics, there may be mentioned lidocaine and tetracaine. As antianginals, there may be mentioned isosorbide

5-mononitrate, molsidomine. As anticholinergic antispasmodics, there may be mentioned metoclopramide, loperamide, mebeverine, papaverine, trimebutine. As antisecretory agents, there may be mentioned cimetidine, ranitidine. As muscle relaxants, there may be mentioned diazepam, progabide, dantrolene, mephenesin, baclofenen, antiulceratives (in the broad sense), antihypertensives, conversion enzyme inhibitors, angiotensin II antagonists, antagonists of calcium β-blockers, central peripheral vasodilators, coronary vasodilators, antiarrhythmics, platelet aggregation inhibitors, antibiotics, oral corticoids, antimigraines, antipsychotics, hypnotics, sedatives and antinauseants.

The polymer according to the invention should satisfy two conditions which are often contradictory, namely, on the one hand, its binding character allowing it to be extruded or injected and then formed and, on the other hand, its instant disintegrating capacity after having been subjected to the drying-forming method.

The physico-chemical properties, the particular concentration which is not very high for fast-disintegrating forms of the matrix polymer(s) and the drying-forming conditions are important criteria because they strongly influence the porosity and the forming by expansion of the form and therefore the rate of disintegration, therefore imposing a rigorous choice of these polymers from the point of view of the chemical structure and the molecular mass, but also a precise control of the vacuum and heat energy parameters used for the implementation of the invention.

Indeed, certain polymers, by virtue of their excessively pronounced hydrophobic character, will not be suitable because whatever their molecular mass, they cannot be dispersed and formulated in an aqueous medium

in a viscosity range allowing their distribution by injection or extrusion. Other hydrophilic polymers with excessively high molecular weight or too sensitive to a rise in temperature do not make it possible to achieve the objective of the invention either.

By contrast, poor control of the operating conditions for drying-forming (vacuum, heat energy, duration) leads, according to the formulation, to forms which are non porous or of heterogeneous porosity or have excessively expanded structures incompatible with the use according to the invention.

These criteria will vary according to the type of polymers or the combination of polymers chosen.

However, it has been observed, in general, that the hydrophilic polymer ought to be in an interval of average molecular mass of between 1000 and 2,000,000 Da, given that for each polymer, a sub-interval of molecular mass can be easily determined by persons skilled in the art, in particular by the disintegration tests indicated above.

Among these polymers, there may be mentioned in particular polysaccharides of plant origin obtained by chemical or enzymatic hydrolysis from native starches. Among the polysaccharides of plant origin obtained by chemical or enzymatic hydrolysis from native starch, there may be mentioned in particular those which correspond with the definition of maltodextrin or of glucose syrup. Preferably, the polymer of plant origin of the polysaccharide type obtained by chemical or enzymatic hydrolysis is chosen from maltodextrins or glucose syrups having dextrose equivalent (DE) levels of between 3 and 50 and preferably between 6 and 34 or mixtures thereof.

There may also be mentioned chemically modified

polysaccharides of plant origin. The expression chemical modified starch is understood to mean sodium glycolate of starch. Among the hydrophilic polymers, there may also be mentioned chemically modified polymers derived from cellulose, alkyl celluloses such as hydroxypropyl cellulose (HPC), hydroxypropyl methyl cellulose (HPMC), hydroxyethyl cellulose, low or medium viscosity carboxymethyl cellulose sodium (CMCNa).

There may also be mentioned polymers of the gum type. As a polymer of the gum type, there may be mentioned guar, gum arabic, xanthane gum, pectin and alginates or mixtures thereof.

Among the synthetic polymers, there may be mentioned polyethylene glycols (PEG), polyvinylpyrrolidone (PVP).

Among the polymers of animal origin, there may be mentioned proteins such as gelatin, collagen, sodium caseinates, chondroitic acid sulfate and hydrolysates thereof, chitosans and soluble hydrolysis derivatives thereof or mixtures thereof.

The mixtures of these various polymers in appropriate proportions are also envisaged. Indeed, for example in the case of a maltodextrin/PVP mixture, there is formation of very soluble microporous structures.

Preferably, the said polymer(s) is/are present in the formulation at a percentage compatible with a viscosity of between 100 mPa.s and 100,000 mPa.s, preferably between 100 and 50,000 mPa.s.

Among the diluents, there may be mentioned mannitol, sucrose, lactose, fructose, sorbitol, xylitol, maltitol and dicalcium phosphate dihydrate.

The composition according to the invention may comprise up to 10% of additives. These additives are in

particular chosen from the group consisting of plasticizers, flavorings, colorings, opacifiers.

Preferably, the composition for pharmaceutical or food use according to the invention has a disintegration time of between 1 second and 10 minutes, preferably of less than 1 minute, advantageously of less than 30 seconds, when taken by the patient whether in the presence of an appropriate volume of water or on direct contact with the buccal mucous membrane or any other mucous membrane to which the microporous expanded form is applied.

It is also possible, according to an advantageous variant, to characterize the composition by its density, preferably of between 0.1 and 0.9 g/cm^3, advantageously between 0.2 and 0.7 g/cm^3.

In addition, the composition according to the invention is such that the active ingredient(s) in the expanded microporous or porous matrix is/are in the dissolved or dispersed state or in film-coated forms.

According to an advantageous embodiment, the final packaging is polypropylene or polytetrafluorothylene (Teflon®).

The invention also relates to a method for preparing the compositions according to the invention comprising the mixing of the active ingredient, diluents and polymers and additives followed by extrusion or direct injection into a mould or blister according to the viscosity of the formulation, this mould or blister and the drying method make it possible to give the composition its final form.

This so-called compact composition is subjected to an instant microwave continuous dielectric treatment under vacuum, optimally bringing about at the same time and

the drying of the form, the creation of porosity and the forming while avoiding reaching excessively high heat levels which can induce degradation of the active ingredient.

The composition is then recovered and packaged, preferably in the context of a continuous process.

According to a general method of use, the method for preparing a fast-disintegrating composition for pharmaceutical, veterinary, food, dietetic or cosmetic use [lacuna] the invention is characterized in that a pasty formulation comprising one or more active ingredients, one or more polymers, one or more diluents and optionally one or more additives is homogenized, it is injected into a blister, and then in that the form is dried-expanded and molded by a microwave-type method under vacuum, to give rise to an isotropic expanded microporous structure, in particular having a density of less than 0.9 g/cm^3.

Preferably, the method for preparing a fast-disintegrating composition for pharmaceutical or food use is characterized in that the drying-forming and control of the porosity are carried out during a simultaneous operation and is such that the vacuum level used is between 30 to 700 $\times 10^2$ Pa and preferably between 60 and 500 $\times 10^2$ Pa (30 to 700 mbar and preferably between 60 and 500 mbar) to give rise to an isotropic expanded microporous structure of regular form, in particular having a density of less than 0.9 g/cm^3.

Advantageously, the method for preparing a fast-disintegrating microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use is characterized in that the pasty formulation obtained by homogenization has a viscosity of between 100 mPa.s and 100,000 mPa.s, preferably between 100 and

50,000 mPa.s, followed by injection or extrusion of this mass into a blister which may be advantageously the final packaging. Preferably, the temperatures during the drying and forming phase are between 25°C and 80°C, thereby avoiding the degradation of the heat-labile active ingredients.

The duration of the drying and forming operation is advantageously less than 1 hour, preferably 30 minutes.

According to an advantageous variation, the blister is the final packaging having a chemical nature a polypropylene or polytetrafluoroethylene type.

The invention will now be illustrated without limitation by the following examples:

Example No. 1

A mixture (MD1) composed of 40% of water, 56% of Maltodextrin having a DE in the region of 19 and 4% of orange flavor whose viscosity is in the region of 600 mPa.s is distributed (about 0.7 to 1 ml) into polypropylene blisters.

These samples are introduced one after the other into a microwave oven, connected to a vacuum pump, and subjected to various operating conditions.

The process is thus carried out and monitored continuously by controlling the energy levels applied to the sample, the temperature of the product and the level of vacuum applied to the sample.

Operating condition a:

The sample is injected into its polypropylene blister and then subjected to a vacuum level of 20×10^2 Pa (20 mbar) and a microwave power such that the sample

absorbs about 11W during the 10 minutes of the process. Under these experimental conditions (1a), the sample very rapidly undergoes uncontrolled expansion and drying, leading to a non isotropic expanded microporous form described as buffed as illustrated on the photograph of figure 1 with a magnification factor of 4, incompatible with a use in the pharmaceutical or food sector.

Operating condition b:

Another sample (0.7 ml) is injected into its polypropylene blister and is subjected for 15 minutes to microwaves with a pressure level of 60×10^2 Pa (60 mbar).

Under these experimental conditions (1b), the sample absorbs between 3 and 4W and undergoes a controlled expansion and drying, leading to an isotropic microporous expanded form having a density in the region of 0.22 and a volume in the region of 3 cm^3, in agreement with the objective in relation to morphology and disintegration. An example of the forms obtained under these conditions on the photograph in figure 2 (magnification factor 4).

Indeed, the samples manufactured according to these experimental conditions exhibit disintegrations of 30 seconds in a glass of water and of the order of about ten seconds in the mouth.

Operating condition c:

Another sample (1c) is injected into its polypropylene blister and is subjected for 20 minutes to an exposure power such that it absorbs 2.5W and a vacuum level of 90×10^2 Pa (90 mbar).

Under these experimental conditions (1c), the sample

undergoes controlled expansion and drying, leading to an isotropic microporous expanded form having a density in the region of 0.22 in agreement with the objective in terms of morphology and disintegration.

Indeed, the samples manufactured according to these experimental conditions exhibit disintegrations of 30 seconds in a glass of water and of the order of about ten seconds in the mouth.

Operating condition d:

Another sample (1d) is injected into its polypropylene blister and is subjected for 15 minutes to an exposure power such that it absorbs about 3.5W and a vacuum level of 90×10^2 Pa (90 mbar) for 5 minutes and then 60×10^2 Pa (60 mbar) for 10 minutes.

Under these experimental conditions (1d), the sample undergoes a controlled expansion and drying, leading to an isotropic microporous expanded form having a density in the region of 0.2 in agreement with the objective in terms of the morphology and the disintegration.

Indeed, the samples manufactured according to these experimental conditions exhibit disintegrations of 35 seconds in 100 ml of water and of the order of about ten seconds in the mouth.

This example perfectly illustrates the invention from the point of view of its process in the sense that the same basic formula, subjected to various microwave drying conditions under vacuum leads to fast-dissolving isotropic microporous expanded forms having completely different and controllable porosity and size uniformity.

Indeed, the drying method according to the invention surprisingly allows, through a judicious choice and

monitoring of the operating conditions, product temperature and vacuum level, to manage the drying, the creation of porosity and the forming of the finished product.

In the examples presented, the source of dielectric energy is the microwave but for considerations of compatibility (degradability, dielectric reactivity) with the formulation or industrial necessities (speed of the process or technological choices), this mode of energy supply may be optionally and advantageously replaced by high frequencies.

Examples No. 2

Example 2a: An isotropic microporous expanded form containing 490 mg of maltodextrin (DE 19), 10 mg of orange flavoring and 100 mg of phloroglucinol dihydrate is obtained after having subjected a pasty mixture having a viscosity in the region of 3000 mPa.s to the experimental conditions previously described in (1b).

The isotropic microporous expanded form obtained having a density in the region of 0.21 and a volume of 2.80 cm^3 exhibits characteristics of disintegration and form in agreement with the objectives (32 seconds) as illustrated in figure 3 (photograph with magnification factor of 5.5).

Example 2b: A form having the same composition but having an uncontrolled expansion level as well as a very heterogeneous microporous expanded structure is obtained by subjecting the same mixture to pressure conditions of 30×10^2 Pa (30 mbar) and an absorbed power of 4W. This form, although in agreement with the disintegration objective (about 30 seconds) is not in agreement with the form objectives given the irregularity of the surface and of the internal network obtained.

Example No. 3

An isotropic microporous expanded form containing 588 mg of maltodextrin (DE 19), 10 mg of mint flavor and 100 mg of phloroglucinol is obtained by subjecting a mixture having a viscosity in the region of 3000 mPa.s to the conditions previously described (1b).

The isotropic microporous expanded form has a controlled expansion level (final volume of 2.75 cm^3) a density in the region of 0.21 and disintegrates within 30 seconds in 100 ml of water and of the order of about ten seconds in the mouth.

Example No. 4

An isotropic microporous expanded form containing 572 mg of maltodextrin (DE 19), 10 mg of mint flavor, 10 mg of xylitol and 100 mg of phloroglucinol is obtained by subjecting a mixture having a viscosity in the region of 3100 mPa.s to the conditions previously described (1b).

The isotropic microporous expanded form obtained in agreement with the objectives has an expansion level (final volume of 2.95 cm^3) a density in the region of 0.22 and disintegrates within about 32 seconds in 100 ml of water and practically instantly in the mouth.

Example No. 5

An isotropic microporous expanded form containing 455 mg of maltodextrin (DE 19), 102 mg of PVP, Kollidon 12PF type, 20 mg of natural mint flavor, 20 mg of xylitol and 100 mg of phloroglucinol is obtained by subjecting a mixture having a viscosity in the region of 3000 mPa.s to the conditions previously described (1b).

The form obtained in agreement with the objectives has an expansion level (final volume of 2·75 cm^3 a density in the region of 0.2, disintegrates within about 30s in 100 ml of water and instantly on contact with the buccal mucous membrane.

Examples 6

Example 6a: An isotropic microporous expanded form having the following composition 515 mg of Maltodextrin (DE 19) and 85 mg of milnacipran is obtained after having subjected to the process a mixture having a viscosity in the region of 2800 mPa.s under the conditions described in example 1b.

This isotropic microporous expanded form has a density in the region of 0.25 and disintegrates [lacuna] 30 seconds in 100 ml of water and instantly on contact with the buccal mucous membrane.

Example 6b: A mixture of the same composition subjected to the same conditions of energy power but to lower pressure levels of the order of 40×10^2 Pa (40 mbar) has an expanded porous structure of uncontrolled form and size as illustrated in the photograph of figure 4 with a magnification of 4 not compatible with a use in the pharmaceutical field.

Examples 7

Example 7a: An isotropic microporous expanded pharmaceutical form having the composition 515 mg of maltodextrin (DE 19), 85 mg of piroxicam is obtained, after having introduced into a polypropylene blister a mixture having a viscosity in the region of 3500 mPa.s. This mixture is subjected in a microwave under vacuum to the following conditions: 3.3W absorbed by sample and a vacuum level of 70×10^2 Pa (70 mbar) for 10 minutes.

Under these experimental conditions (7a), the samples have a structure in accordance with the objective with an expansion level in the region of 3.5 and a disintegration of 35 seconds in 100 ml of water and instantly in contact with the buccal mucous membrane.

Example 7b: Under different experimental conditions, namely 8W absorbed by sample and a vacuum level of 30 $\times$ 10^2 Pa (30 mbar) for 7 minutes, the form obtained having the same composition although in accordance with the objectives in terms of disintegration is not suitable in terms of form.

Example No. 8

An isotropic microporous expanded pharmaceutical form having the composition 515 mg of maltodextrin (DE 19) and 85 mg of domperidone in agreement with the objectives according to the invention is obtained, after having introduced into a polypropylene blister a mixture having a viscosity in the region of 3500 mPa.s. This mixture is subjected in the microwave oven under vacuum to the following conditions: 3W absorbed by sample and a vacuum level of 65 $\times$ 10^2 Pa (65 mbar) for 10 min.

Example No. 9

An isotropic microporous expanded pharmaceutical form having the composition 100 mg of maltodextrine (DE 19), 650 mg of mannitol and 50 mg of piroxicam is obtained after having subjected to the drying process (between 90 $\times$ 10^2 and 500 $\times$ 10^2 Pa (90 and 500 mbar) for 0.5 h) a pasty composition having a viscosity of 2000 mPa.s. Under these judiciously chosen operating conditions, the form obtained has morphological characteristics of disintegration and in agreement with the objectives.

Example No. 10

Under experimental conditions described in example 1b, it was possible to obtain instant-disintegrating isotropic microporous expanded pharmaceutical forms having the composition 100 mg of phloroglucinol, 40 mg of sodium caseinate, 20 mg of xylitol and 400 mg of mannitol.

Example No. 11

In a similar manner, pharmaceutical forms of the following composition, namely 100 mg of phloroglucinol, 50 mg of chitosan and 400 mg of maltodextrin having a DE in the region of 19 were able to be obtained. These forms have morphological and disintegration characteristics in agreement with the objectives.

Example No. 12

Mixtures based solely on maltodextrin or glucose syrup having different dextrose equivalents (6, 14, 21, 34) flavored either with orange or mint flavor or with coffee extract and initially containing 30 to 40% of water, made it possible, after having been subjected to microwaves under vacuum (90×10^2 to 500×10^2 Pa (90 to 500 mbar) for 0.5 h) the obtaining of expanded microporous forms instantly soluble in water and in agreement with the objective in terms of the form. These isotropic microporous expanded single-dose compositions may be easily used as refreshing drinks.

Example 13

Isotropic microporous expanded forms containing 500 mg of lactose, 40 mg of Maltodextrin (DE 19) and 50 mg of piroxicam were obtained by subjecting a mixture having an initial water content of the order of 20% (w/w) to modulation of the experimental conditions, by reducing

in particular the microwave power transmitted to the sample and by working at pressure values of between 100×10^2 and 500×10^2 (100 and 500 mbar) for 0.5 h.

These forms have, after exposure to the treatment of the invention, a water content of less than 1% of the total mass.

These isotropic microporous expanded forms have a disintegration time in agreement with the objective.

Example 14

Isotropic microporous expanded forms containing 500 mg of lactose, 30 mg of carboxymethyl cellulose sodium (low viscosity) and 10 mg of piroxicam were obtained by subjecting to the experimental conditions 13 a mixture having an initial water content of the order of 30% (w/w).

These forms have, after exposure to the treatment of the invention, a water content of less than 1% of the total mass.

These isotropic microporous expanded forms have a disintegration time in agreement with the objective.

Example 15

Isotropic microporous expanded forms containing 500 mg of lactose, 10 mg of xanthan gum + 60 mg of maltodextrin of DE 34 and 10 mg of piroxicam were obtained by subjecting to the experimental conditions 13 a mixture having an initial water content of the order of 30% (w/w).

These forms have, after exposure to the treatment of the invention, a water content of less than 1% of the total mass.

These microporous forms have a disintegration time in agreement with the objective.

Example 16

A batch of 500 microporous expanded forms containing 450 mg of mannitol, 67 mg of maltodextrin of DE 19, 7 mg of mint flavor and 21 mg of piroxicam was obtained in 30 min on an industrial microwave tool under vacuum under conditions similar to the operating conditions previously described in example 13.

The forms obtained having morphological and disintegration characteristics in agreement with our objectives proved, in addition, stable after having been subjected to an accelerated stability study at 40°C/75% Relative Humidity for 6 months.

Example 17

A batch of 500 microporous expanded forms containing 450 mg of mannitol, 67 mg of maltodextrin of DE 19, 7 mg of mint flavor and 21 mg of domperidone was obtained in 30 minutes on an industrial microwave tool under vacuum under conditions similar to the operating conditions previously described in example 13.

The forms obtained having morphological and disintegration characteristics in agreement with our objectives proved, in addition, stable after having been subjected to an accelerated stability study at 40°C/75% Relative Humidity for 6 months.

CLAIMS

1. A composition for pharmaceutical, veterinary, food, dietetic or cosmetic use, comprising 1% to 50% by weight of one or more active ingredients, 50% to 99% by weight of a carrier comprising one or more polymers, optionally one or more diluents and optionally one or more additives, in particular a flavoring or a coloring, said composition being characterized in that it has a fast-dissolving isotropic microporous expanded structure and the polymers being chosen from the group consisting of polymers of plant origin, optionally in combination with polymers of animal origin or synthetic polymers, and said carrier being such that the binding polymer(s) are present in the composition in a proportion greater than or equal to 1% (w/w) and more particularly of between 6% and 98% (w/w) and in that it is capable of being obtained by the method comprising the steps of:

- homogenizing a pasty formulation comprising the active ingredient(s), the polymer(s), optionally the additive(s) and the diluents,
- injecting into a molding component,
- simultaneous drying and molding by a microwave or high-frequency type method with a vacuum level of between 30 and 700 $\times 10^2$ Pa.

2. The fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 1, characterized in that the polymer of plant origin is chosen from the polysaccharides obtained by chemical or enzymatic hydrolysis of the chemically modified starch, the polymers of the chemically modified cellulosic type or the polymers of the gum type or mixtures thereof.

3. The fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic

use as claimed in claim 2, characterized in that the polysaccharide is chosen from maltodextrins or glucose syrups, and sodium glycolates of starch or mixtures thereof.

4. The fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 3, characterized in that the polymer of plant origin is chosen from maltodextrins and glucose syrups having a dextrose equivalent (DE) level of between 3 and 50 and preferably between 6 and 34 or mixtures thereof.

5. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 2, characterized in that the polymer of plant origin of the cellulosic type is chosen from carboxymethyl cellulose sodium low or medium viscosity, hydroxypropyl methyl cellulose, hydroxypropyl cellulose, hydroxyethyl cellulose or mixtures thereof.

6. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use [lacuna] claim 2, characterized in that the polymer of plant origin is of the guar gum, gum arabic, xanthane, pectin and alginate type or mixtures thereof.

7. The fast-dissolving pharmaceutical, veterinary, food, dietetic or cosmetic composition as claimed in claim 1, characterized in that the synthetic polymer is polyvinylpyrrolidone.

8. The fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 1, characterized in that the polymer of animal origin is chosen from sodium caseinates, chitosan, their water-soluble hydrolysis

derivatives, gelatin, collagen, chondroitic acid sulfate and hydrolysates thereof or mixtures thereof.

9. The fast-dissolving isotropic expanding microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in any one of the preceding claims, characterized in that said polymer(s) is/are present in the formulation at a percentage at least equal to 1% (w/w) and more particularly between 6% and 98% (w/w), and compatible with a viscosity of between 100 mPa.s and 100,000 mPa.s.

10. The fast-dissolving isotropic expanded microporous pharmaceutical, veterinary, food, dietetic or cosmetic composition as claimed in claim 9, characterized in that said polymer(s) are present in the formulation at a percentage at least equal to 1% (w/w) and more particularly between 6 and 98% (w/w), and compatible with a viscosity of between 100 and 50,000 mPa.s.

11. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use, characterized in that the optional diluent is chosen from mannitol, sucrose, lactose, fructose, sorbitol, xylitol, maltitol and dicalcium phosphate dihydrate.

12. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of the preceding claims, characterized in that the density is less than 0.9 g/cm^3.

13. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 12, characterized in that the density is between 0.2 and 0.7 g/cm^3.

14. The fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of the preceding claims, characterized in that it has a disintegration time of less than 1 minute, preferably 30 seconds, under conditions of use on direct contact with a mucous membrane in particular the buccal mucous membrane or in an appropriate volume of water.

15. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of the preceding claims, characterized in that the active ingredient(s) in the isotropic expanded microporous matrix are in the dissolved or dispersed state or in film-coated forms.

16. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 15, characterized in that the active ingredient(s) are chosen, without limitation, from analgesics, antimigraines, antipyretic analgesics and/or anti-inflammatory agents, local anesthetics, antianginals, anticholinergic antispasmodics, antisecretory agents, muscle relaxants, antinauseants, central and peripheral vasodilators.

17. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 16, characterized in that the active ingredient is chosen from the group consisting of Milnacipran, piroxicam, phloroglucinol, domperidone.

18. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of the

preceding claims, characterized in that the final packaging serving as molding component is of the polypropylene type.

19. The fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of claims 1 to 17, characterized in that the final packaging is of the polytetrafluoroethylene type (e.g.: Teflon®).

20. A method for preparing a fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claims 1 to 19, characterized in that a pasty formulation comprising one or more active ingredients, one or more polymers, optionally one or more additives and one or more diluents is homogenized, it is injected into a molding component, and then in that drying and molding are carried out simultaneously by a microwave or high frequency type process with a vacuum level of between 30 and 700×10^2 Pa and preferably between 60 and 500×10^2 Pa (30 and 700 mbar and preferably between 60 and 500 mbar) to give rise to an isotropic microporous expanded structure of regular form, in particular having a density of less than 0.9 g/cm^3.

21. The method for preparing a fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claim 20, characterized in that the pasty formulation obtained by homogenization has a viscosity of between 100 mPa.s and 100,000 mPa.s, preferably between 100 and 50,000 mPa.s, followed by injection or extrusion of this mass into the final packaging.

22. The method for preparing a fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic

use according to either of claims 20 and 21, characterized in that the temperatures during the drying and forming phase are between 25°C and 80°C, thereby avoiding the degradation of the heat-labile active ingredients.

23. The process for preparing a fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in claims 20 to 22, characterized in that the duration of the drying and forming operations are simultaneous and are less than 1 hour, preferably 30 minutes.

24. The method for preparing a fast-dissolving composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of claims 20 to 23, characterized in that the component in which simultaneous drying-molding is carried out is the final packaging.

25. The method for preparing a fast-dissolving isotropic expanded microporous composition for pharmaceutical, veterinary, food, dietetic or cosmetic use as claimed in one of claims 20 to 24, characterized in that the method of production is carried out continuously.

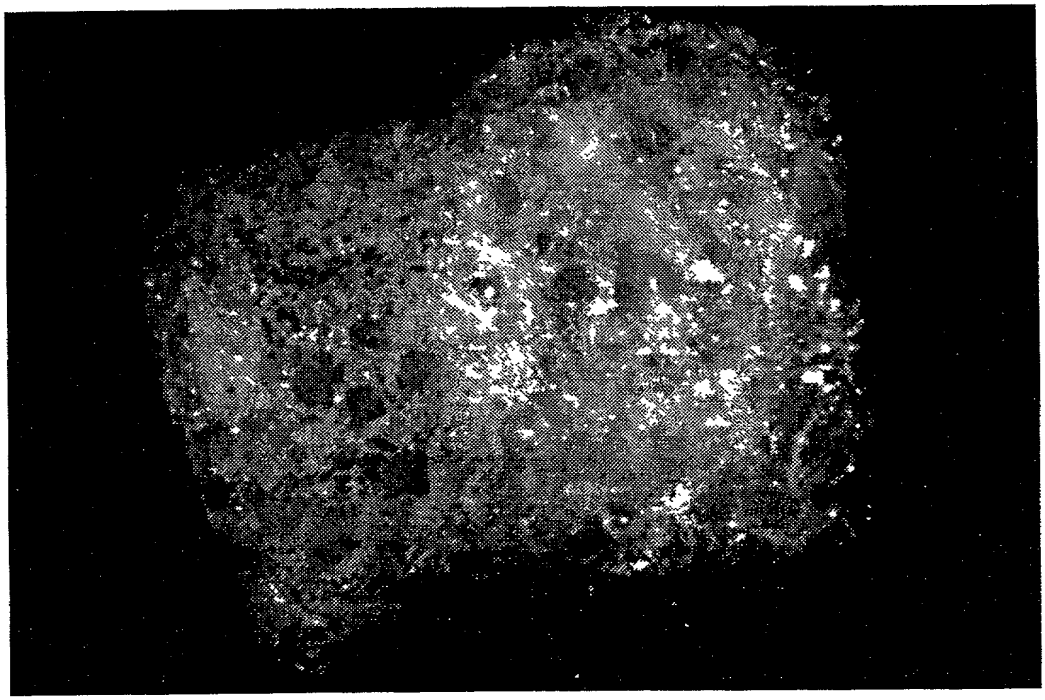

FIG. 1

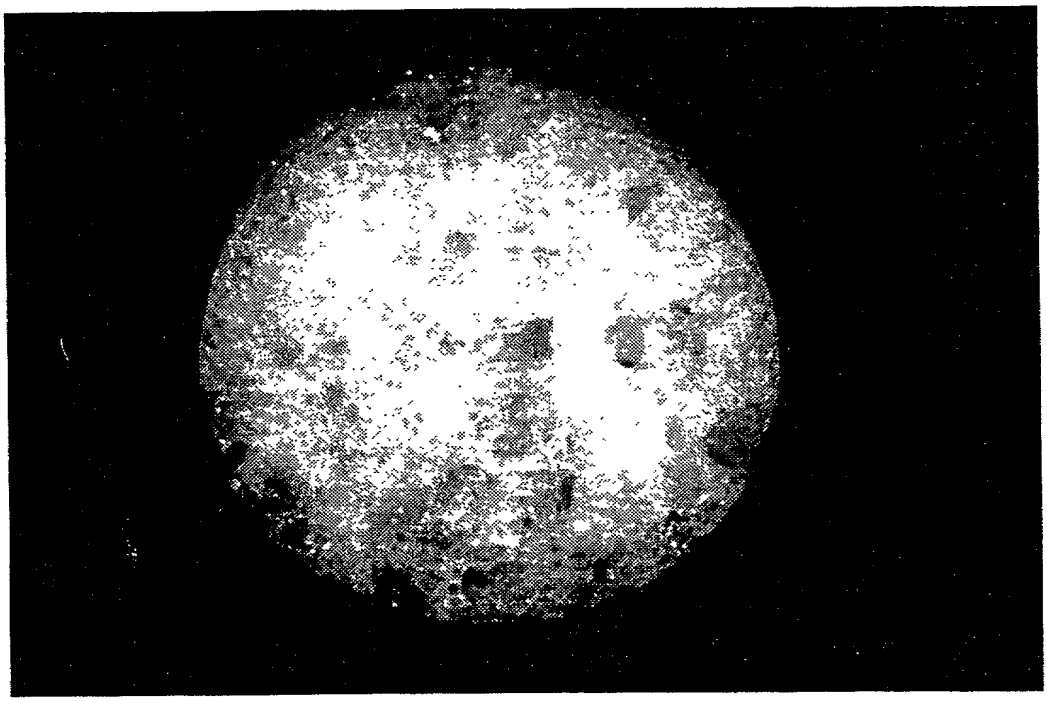

FIG. 2

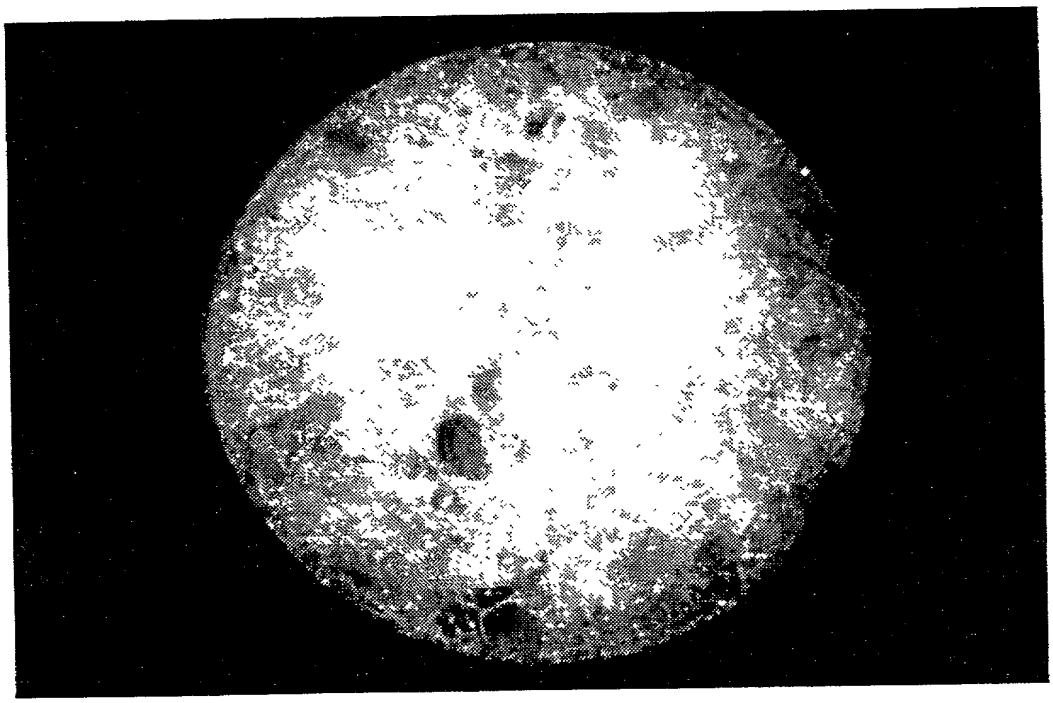

FIG. 3

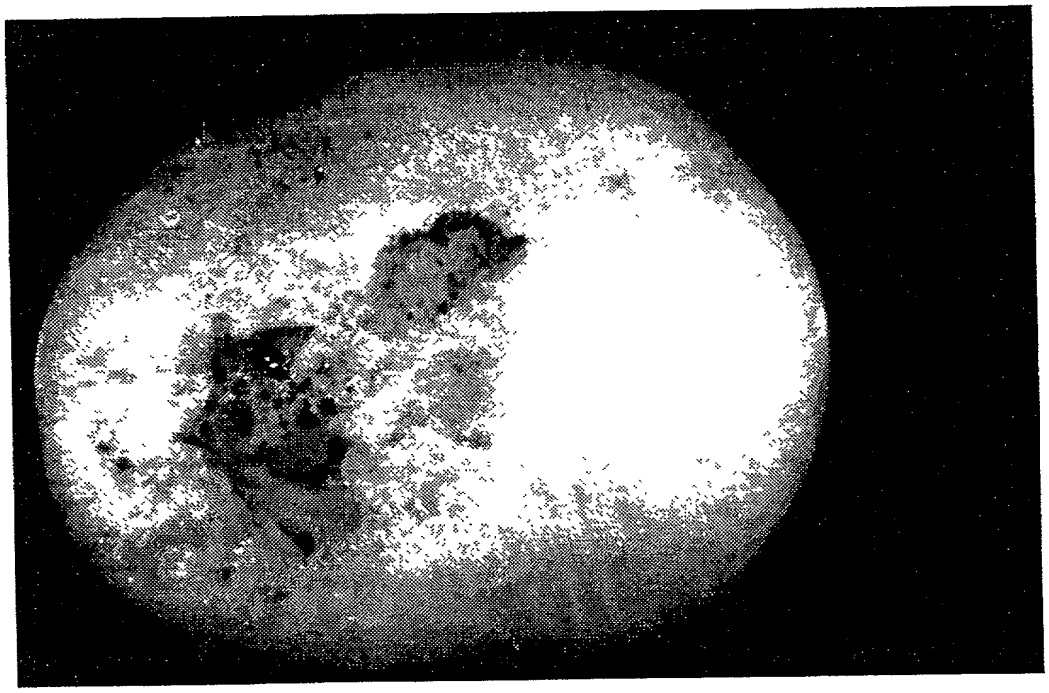

FIG. 4

Docket Number: PF 100 PCT US

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name, and

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

FAST-DISSOLVING ISOTROPIC EXPANDED MICROPOROUS COMPOSITION OR STRUCTURE FOR PHARMACEUTICAL, VETERINARY, DIETETIC, FOOD OR COSMETIC AND USE AND METHOD FOR OBTAINING SAME

the specification of which (check one of the following)

☐ is attached hereto

☐ was filed on _____ as
Application Serial No. _____
And was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

Application Serial Number	Country	Filing Date (Day/Month/Year)	Priority Claimed (yes/no)
99 04033	FRANCE	31/March/1999	Yes

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

Docket Number: _____

(Application Serial No.)	(Filing Date)	(Status ~~-patented~~, pending~~, abandoned~~)
PCT/FR00/00803	30.03.2000	
(Application Serial No.)	(Filing Date)	(Status – patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status – patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following person registered to practice before the Patent and Trademark Office as my attorney with full power of substitution and revocation to prosecute this application and all divisions and continuations thereof and to transact all business in the Patent and Trademark Office connected therewith and request that all correspondence be sent to him at the mailing address hereafter given:

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Docket Number: _____

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